

## ABSTRACT

MUC1-specific binding members for cancer-associated MUC1 protein comprise a MUC1 binding domain, or portion thereof, for binding to an epitope of the protein core of MUC1. The MUC1-specific binding members comprise various antibody molecules and fragments thereof, including Fab antibodies; scFv antibodies; double scFv antibodies; diabodies; recombinant, full-length immunoglobulins; and immunocytokine fusion proteins; that are used in methods of diagnosing and treating cancer in various tissues, including breast, ovary, bladder, and lung, and in methods of purifying or isolating MUC1 protein. Polynucleotide molecules encoding MUC1-specific binding members, or portions thereof, are also described.